1107-86-423 **Jonah Bloch-Johnson*** (me@jonah.org), 1416 E55th St, Chicago, IL 60615, and **Raymond T Pierrehumbert**. *The Temperature Dependence of Feedbacks and Equilibrium Climate Sensitivity.*

Studies of the Earth's equilibrium climate sensitivity commonly assume that the long-term warming caused by an increase in atmospheric CO_2 will be roughly proportional to the amount of radiative forcing caused by such an increase. This assumption is equivalent to assuming that the overall climate feedback remains unchanged as the planet warms. In this paper, we assess this claim by examining the behavior of a simple conceptual model of climate sensitivity that accounts for temperature-dependent feedbacks over a range of likely parameter values informed by physical arguments and output of general circulation models. We find that the nonlinearity caused by this temperature dependence can greatly alter the warming response to one doubling of CO_2 when the sensitivity is high, and alters the response generally for two doublings. Loss of stability, in particular, is possible for likely parameter values. Our work has several implications: in some cases, model blow-up may be physical; estimates of equilibrium climate sensitivity from observations may give incorrect estimates of the risk of high warming; and it may be possible to rule out the extremes of high warming caused by low cloud feedbacks. (Received January 20, 2015)